

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,953	<b>Applicant(s)</b> KANO ET AL.	
	<b>Examiner</b> TABASSOM TADAYYON ESLAMI	<b>Art Unit</b> 1712	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2011.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 5) ☒ Claim(s) 1-6,9-12,20,22,23 and 26-31 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-6,9-12,20,22,23 and 26-31 is/are rejected.
- 8) ☐ Claim(s) 7-8, 21 is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                                  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/08/11</u> . | 6) <input type="checkbox"/> Other: ____.   |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 9, 20, 26-27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Tricia Lynn Breen et al (U. S. Patent Application: 2003/0132121, here after Breen).

Claim 1 is rejected. Breen teaches a method of forming a metal pattern, comprising the steps of: (I) forming on a substrate (30) a polymer layer in a pattern form (38, ligating agent) [0129].

(II) adding the electroless plating catalyst or precursor thereof to the polymer layer(40); and (III) forming a metal layer(40, platinum) in the pattern form by electroless plating[fig. 3.c - fig. 3.e, 0122, 0131]. Breen also teaches the compound polymer has a polymerizable group and a functional group that interacts with an electroless plating catalyst or a precursor thereof [abstract, 0038].

Claim 2 is rejected. Breen teaches the limitation of claim 1 and also teaches the step (I) further comprises: a step of forming a polymerization initiating layer in which a polymer having, on a side chain thereof, a crosslinking group and a functional group having polymerization initiating capability is immobilized by a crosslinking reaction on a base material(layer 28 on stamp 20)[0094 lines 1-2, 0095]; and

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a step of forming the polymer layer in the pattern form onto the polymerization initiating layer by using a compound which has a polymerizable group and a functional group that interacts with the electroless plating catalyst or precursor thereof (transferring the layer 28 from stamp to treated substrate surface) [0118].

Claim 3 is rejected. Breen teaches the limitation of claim 1 and also teaches forming a substrate a polymer layer by using a compound which has a polymerizable group and a functional group whose structure is changed to a structure that interacts with the electroless plating catalyst or precursor thereof or loses the interaction capability with the electroless plating catalyst or precursor thereof, due to application of acid [forming ligating agent on stamp, 0129, 0086 lines 6-end], and forming the polymer layer in a pattern form (transferring the ligating agent to substrate surface), so that the polymer layer in the pattern form interacts with the electroless plating catalyst or precursor thereof, due to application acid and [0086 lines 6-end] (II) adding the electroless plating catalyst or precursor thereof to the polymer layer; and (III) forming a metal layer in the pattern form by electroless plating [see claim 1 rejection, 0131].

Claim 4 is rejected. Breen teaches a substrate having a polymerization initiating layer in which a polymer having, on a side chain thereof, a crosslinking group and a functional group having polymerization initiating capability is immobilized by a crosslinking reaction on a base material [0094 lines 1-2, 0038, 0095].

Claim 9 is rejected. Breen teaches a step of carrying out drying after the step (III) [0131 lines 1-5].

Claim 20 is rejected. Breen teaches a method of forming a conductive film, comprising the steps of:

(A) producing a substrate(stamp, 20) having a polymerization initiating layer(28) in which a polymer having, on a side chain thereof, a crosslinking group and a functional group having polymerization initiating[0094 lines 1-3] capability is immobilized by a crosslinking reaction on a base material[0095, 0038, 0106]; Breen also teaches treating a base material(substrate) to modify it and therefore by contacting the ligating agent from the stamp to the base[fig. 3b – fig. 3.e];

(B) generating a graft polymer (cross linked) by using a compound which has a polymerizable group and a functional group that interacts with an electroless plating catalyst or a precursor thereof directly onto the entire surface of the polymerization initiating layer [0118];

(C) adding the electroless plating catalyst or precursor thereof to the graft polymer; and

(D) forming a metal layer by electroless plating[0130, 0131].

Claims 26-27 and 30 are rejected. Breen teaches the functional group that interacts with an electroless plating catalyst or a precursor thereof is a phosphine group [0084, 0115].

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-6, and rejected under 35 U.S.C. 103(a) as being unpatentable over are Tricia Lynn Breen et al (U. S. Patent Application: 2003/0132121, here after Breen).

Claim 5 is rejected. Breed teaches the limitation of claim 1 as discussed above. Breen teaches: a step of contacting a compound having a polymerizable group and a functional group (ligating agent) that interacts with the electroless plating catalyst or precursor thereof with the substrate in a patterned form[see claim 1 rejection]. Although Breen teaches patterning is with contact printing [figs. 3a-3g] and not via photolithography however Breen also teaches forming the patterned layer by lithography method composing applying ligating agent and then patterning by photolithography and applying catalyst layer[0097 lines 11-15],which inherently involves irradiating the substrate with radiation in the pattern form. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making metal pattern structure that Breed teaches where the ligating agent layer is patterned by photolithography, because the prior art taught by Breen teaches it is a method to apply patterned polymer layer to a substrate.

Claim 6 is rejected. Breen teaches the limitation of claim 5, wherein the substrate in the step (1-2) is a substrate having a polymerization initiating layer in which a polymer having, on a side chain thereof, a crosslinking group and a functional group having polymerization initiating capability is immobilized by a crosslinking reaction on a base material[009.

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5. Claims 10-11, 22, 28, 31 rejected under 35 U.S.C. 103(a) as being unpatentable Tricia Lynn Breen et al (U. S. Patent Application: 2003/0132121, here after Breen), further in view of Masaharu Shirai et al(U. S. Patent: 5998739, here after Shirai).

Breen teaches the limitation of claims 1, 3, and 20. Breen teaches forming metal conductive layer on insulating substrate by electroless plating a catalytic layer and then electroless plating of the metal layer. Breen does not teach the metal layer forms by electroplating. Shirai teaches a method of making multilayer circuit board by forming a catalytic layer with electroless plating on a insulating substrate and forming metal layer on it with electroless plating, and also teaches using electroplating to reach desired thickness of the metal layer [column 1 lines 32-44]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making metal pattern structure that Breed teaches where the metal layer is deposited by electroless plating following by electroplating to reach to a desired thickness as Shirai teaches, because it is faster to get desire thickness by electroplating method. It is also inherent to dry the circuit board after electroplating step, because the device can not function in wet condition.

6. Claims 12, 23, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable Tricia Lynn Breen et al (U. S. Patent Application: 2003/0132121, here after Breen), further in view of Yoshiaki Tomari et al( U. S. Patent: 6156413, here after Tomari).

Breen teaches a method of making metal lines on a substrate comprising depositing catalyst layer with electroless, and then depositing a metal layer. Breen also

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teaches the substrate is glass [0102]. Breen does not teach the roughness of the substrate. Tomari teaches a method of making circuit (metal lines) on a glass substrate by applying catalytic layer and then depositing metal plating layer[abstract, column 1 lines 6-11], and further teaches the roughness of the glass substrate is 0.0012 to 0.02 micron[column 17 lines 19-31]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making metal pattern structure that Breed teaches where the surface roughness of they glass substrate is 0.0012 to 0.02micron, because Tomari teaches it is suitable surface roughness for glass substrate to make circuits.

#### ***Allowable Subject Matter***

7. Claims 7-8 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The examiner fails to find a reference teaching forming a photoresist layer in a base layer, forming an adhesive layer on the photoresist layer, and irradiating the polymer to form patterned adhesive layer. Regarding claim 21, Breen teaches treating the substrate with irradiating, not the polymer compound.

#### ***Response to Arguments***

8. Applicant's arguments, see Remarks, filed 11/07/11, with respect to the rejection(s) of claim(s) under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a

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new ground(s) of rejection is made in view of Breen et al. For detail, see claim rejection above.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TABASSOM TADAYYON ESLAMI whose telephone number is (571)270-1885. The examiner can normally be reached on 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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